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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/967,310	09/28/2001	Kiyoshi Yamaura	112857-302	5205
29175	7590	02/10/2004	EXAMINER	
BELL, BOYD & LLOYD, LLC P. O. BOX 1135 CHICAGO, IL 60690-1135			MERCADO, JULIAN A	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 02/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/967,310		YAMAURA ET AL.	
	Examiner		Art Unit	
	Julian Mercado		1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 8-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-7 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2/19/02 6) ☐ Other: _____

Art Unit: 1745

DETAILED ACTION

Election/Restrictions

Claims 8-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in the applicant's reply filed November 24, 2003.

Claims 1-7 and 17 are pending for consideration. The examiner notes that this Office action has included independent claim 17 with Group I, as this claim was inadvertently left out of the listing of pending claims in the prior restriction requirement.

Claim Rejections - 35 USC § 102 and 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wilkinson et al. (U.S. Pat. 5,672,439).

Art Unit: 1745

Regarding independent claim 1, Wilkinson et al. teaches a fuel cell with a gas diffusion electrode [30] of a carbonaceous material such as carbon fiber paper, with a catalytic layer [78] such as platinum disposed on a second surface region of the carbonaceous material, i.e. the surface of layers [72, 74] facing inward. (Figure 4, col. 7 line 7-15, col. 6 line 13, col. 8 line 29-33, also applies to dependent claims 2, 4, 7) Note that the catalytic layer is sandwiched between both surfaces. The examiner notes that the recitation of the catalytic layer being "formed on" a surface has not been given the effect of a limitation in the claim as the limitation does not give breadth or scope to the product claim. The claimed product appears to be the same or similar to the prior art product insofar as having a catalytic layer [78] in mutual contact with a surface region of the carbonaceous material. In the event that any differences can be shown by the product of the product-by-process claims, such differences would have been obvious to the skilled artisan as a routine modification of the product absent of a showing of unexpected results.

In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985).

The first surface region, i.e. the outer surface of layers [72, 74], to which a proton conduction unit is in contact therewith, has less of an amount of catalytic material than that in the second surface region to the extent that what appears to be a substantially or complete absence of catalytic material in the first surface region is less than the amount specifically disclosed to be in the second surface region. The examiner notes that the scope of the present claims does not preclude a "zero amount" of catalytic material to be in the first surface region.

In an alternative consideration of independent claim 1, Figure 6 of Wilkinson et al. teaches a second embodiment, in which catalytic layer [86] on outer first surface region [80a] or [80b] of the electrode material (discussed above as carbonaceous fiber material) is less than the

Art Unit: 1745

catalytic layer on a second surface region, e.g. the second surface region within which adjoining catalytic layers from a plurality of electrically conductive sheet material [82] are brought together in mutual contact, "[c]atalytic particles 86 are disposed at both major planar surfaces of each layer". (col. 7 line 21-22) Because the second surface region as defined herein has *two* of these catalytic layers, the first surface region in having only *one* catalytic layer has less of an amount of catalytic material than that in the second surface region. [emphasis added]

As to dependent claim 3, the electrochemical device in Wilkinson et al. is an air cell to the extent that air is the oxidant for the cathode. (col. 8 line 52)

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et al. as applied to claims 1-4 and 7 above as evidenced by Edie et al. (Effect of Microstructure and Shape on Carbon Fiber Properties, pp. 41-45, 1993, Noyes Publications, New Jersey)

The teachings of Wilkinson et al. are discussed above.

As to dependent claims 5 and 6, while Wilkinson et al. does not explicitly teach the carbon fiber paper to contain graphite or have a tubular structure, it would naturally flow for the fiber paper to inherently contain graphite as claimed as well as the fibers to have a tubular structure, absent of a showing by applicant that the claimed invention distinguishes over the reference. *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977) and *In re Spada*, 15 USPQ 2d 1655 (Fed. Cir. 1990) As evidence, Edie et al. teaches that carbon fibers are composed of graphite crystallites (page 44, 2nd full paragraph) with said fibers having a tubular structure along the fiber axis, as shown in Figure 1.

Art Unit: 1745

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et al. as applied to claims 1-4 and 7 above, in view of Watanabe et al. (U.S. Pat. 5,728,485)

The teachings of Wilkinson et al. are discussed above.

As to independent claim 17, while Wilkinson et al. does not explicitly teach that the carbonaceous material is embedded within a proton conduction unit, Watanabe et al. teaches that a proton conduction unit such as a Nafion ion exchange resin is intertwined with catalyst-carrying carbon fibers. (col. 7 line 52-58) In Watanabe et al., this Nafion membrane is employed between the electrodes of the final fuel cell as the proton conduction unit. (col. 10 line 33-35) As discussed above, an embodiment of Wilkinson et al. as illustrated in Figure 6 thereof shows a first surface region, i.e. the outer surface having a catalytic layer, less than that in the second surface region, i.e. the sum total of catalytic material between electrically conductive sheet material layers [82] and [83]. Thus, the skilled artisan would find obvious that the first surface region of Wilkinson et al. would be embedded within the proton conduction unit served by the Nafion membrane (also employed by Wilkinson et al.), because the first surface region in Wilkinson et al. is the outer surface of the electrode that would come into contact with the Nafion membrane, and as shown by Watanabe et al., catalyst-carrying carbon fibers are intertwined with the adjoined Nafion membrane. The skilled artisan would also find obvious the rationale that even if all of the first surface region catalytic layer was embedded within the Nafion membrane, the amount of catalytic layer in the embedded portion would still be less than the amount of catalytic layer in the second portion, since the first surface region has at most half the amount of catalyst material than the second surface region.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



jam



Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700